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Very early diagnosis of HIV infection in newborn at day 0–day 3 on DBS in Cambodia

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Background

In resource constrained settings where prevention of mother to child transmission of HIV-1 (PMTCT) programs are in place, the proportion of residual *in utero* transmission (rIUT) versus *peri partum* transmission (PPT) is unknown and the morbidity/mortality related, or not, to MTC transmission of HIV-1, within the first 6 weeks of life, poorly documented.

Main objective

To assess the feasibility and the contribution of the very early diagnosis on Dried Blood Spot (DBS), conducted at day 0–day 3 of age in improving the medical care of HIV-1 exposed newborn within the first 6 weeks of life.

Methods

Very early diagnosis was explained and proposed, before and/or after delivery, to HIV positive mothers delivering at Calmette and hospitals and health centers supported by Magna Children at Risk (NMCHC, Chey Chumneas Hospital and 3 Municipality Health Centers). A first negative HIV-DNA negative DBS at day 0–day 3 was followed up by a second DBS at W6. HIV-DNA positive DBS at d0–d3, or at week 6 were followed up by a venipuncture as soon as possible for HIV-RNA quantification (Kit G2 ANRS) and CD4 count.

Preliminary results

Heel prick blood specimens were spotted on DBS for 272 newborns (ratio M/F = 1.3) at d0–d3. HIV DNA was detected in 3 of 272 babies (rIUT rate: 1.1%). One of them died before week 6. The two others presenting detectable HIV-1 RNA viral loads at week 6 (6.4 and 6.9 $\log_{10}$ copies/ml with CD4 at 19% and 21%, respectively) started first line ARV regimen and became HIV-1 RNA undetectable after 10 and 4 months of treatment. Among the 269 HIV-DNA negative newborn at d0–d3, 228 (84.5%) have been already seen at week 6 for virological confirmation, 23 are still waiting for the visit of the week 6, 14 were lost of follow up and 4 died without any AIDS clinical symptoms. 226 of 228 DBS were confirmed HIV-DNA negative at week 6 whereas 2 infants became HIV-DNA positive (PPT rate: 0.8%). Both were confirmed HIV-RNA positive two weeks later (5.8 and 6.2 $\log_{10}$ copies/ml with CD4 at 33% and 26%, respectively) and will soon begin their ARV treatment.

Discussion

The rIU and PP transmission rates were low in this study (1.1% and 0.8% respectively). 5 new born were diagnosed HIV infected. One died before W6, and 2 already started ARV treatment. Further investigations are undergoing to understand why 14 newborn were lost of follow up. These preliminary results demonstrate the feasibility of a mini-

mally invasive very early diagnosis, done shortly after birth. The small amount of blood required, the ease of collection, storage, and transport of samples, and the low cost of the test make it ideal for HIV-1 testing of infants in remote maternities in Cambodia.